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Howard R. Petty

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MARSHALL, GERSTEIN & BORUN LLP
233 S. WACKER DRIVE, SUITE 6300
SEARS TOWER
CHICAGO, IL 60606

EXAMINER

ROY, BAISAKHI

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/10/07 have been fully considered but they are not persuasive. With respect to Shapiro et al., the device is used for measuring the fluorescence of the retina, where flavoprotein fluorescence is enhanced and non-flavoprotein fluorescence is reduced where the filter separates out the different wavelengths of light. Light in the range of 380 nm to 470 nm excites flavoproteins to fluoresce and is passed through the filter. The filter separates out the reduced flavoprotein from the oxidized flavoprotein and then appropriate flavoprotein measurements can be made (col. 7 lines 30-50). Shapiro et al. clearly teach separating out and obtaining measurements from different regions of the retina corresponding to flavoprotein or non-flavoprotein fluorescence. It would be obvious to combine with Grinvald et al. to generate an image to determine the contrast between maximized and minimized fluorescence to distinguish between flavoprotein and non-flavoprotein fluorescence. The previous rejection is therefore maintained and repeated below.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-14 and 16-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapiro et al. (4569354) in view of Grinvald et al. (6478424).

Shapiro et al. disclose a device and method for measuring the fluorescence of flavoprotein in the retina. Shapiro et al. teach the use of an excitation light source such as a mercury lamp or laser to provide an excitation light at a wavelength corresponding to excitation of flavoprotein autofluorescence, an image capture device adapted to record a single image representative of a retinal fluorescence signal generated in response to the excitation light, including a filter that reduces background wavelengths from the retina fluorescence signal, and an image intensifier adapted to increase the retinal fluorescence signal strength (col. 4 lines 39-56). The filter prevents detection of wavelengths beyond those associated with flavoprotein auto-fluorescence and limit detection to the most meaningful wavelengths (col. 4 lines 5-17, col. 5 lines 13-33).

Shapiro et al. do not explicitly teach an image capture device adapted to record a single image representative of a retinal fluorescence signal and further intensifying the single image to increase the signal strength of the retinal autofluorescence and analyzing the single image to determine a contrast. In the same field of endeavor Grinvald et al. disclose a non-invasive system and method of measuring the metabolic activity of a retina. Grinvald et al. disclose a system for imaging reflectance changes, intrinsic or extrinsic fluorescence changes of a retina due to normal retinal function, processing stored images to reveal a differential optically detectable functional response signal corresponding to the retina's function (col. 6 line 51 – col. 7 line 38). Grinvald et al. teach filtering the illumination light to be of any desired wavelength or combination of wavelengths or of a wavelength suitable for exciting the voltage-sensitive fluorescent probe being used. In the fluorescence mode, Grinvald et al. teach the use of post-

retinal filtering to pass light at the emission wavelength to the imaging device while reflected light at the excitation wavelength is removed (col. 4 lines 15-38). Therefore Grinvald et al. teach the use of differential image analysis to reveal differences between the two sets of images, where one is a response image and one is a blank image (col. 7 lines 3-38). In the differential image, the unchanging background is removed to maximize the excitation of flavoprotein auto-fluorescence and minimize the excitation of non-flavoprotein auto-fluorescence (col. 7 lines 39-60). It would have therefore been obvious to one of ordinary skill in the art to use the teaching by Grinvald et al. to modify the teaching by Shapiro et al. for the purpose of increasing the intensity of the functional aspects of the image and minimizing the non-functional changes demonstrated by varying intensities of dark to light regions to clarify the image to extract clinically relevant parameters (col. 7 lines 52-60, col. 8 lines 15-18).

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BAISAKHI ROY whose telephone number is (571)272-7139. The examiner can normally be reached on M-F (7:30 a.m. - 4p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian L Casler/
Supervisory Patent Examiner, Art
Unit 3737

BR
/B. R./
Examiner, Art Unit 3737